

Application No. 10/076,550
Reply to Official Action mailed on July 30, 2007

The listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. [original] A television cable tuner front end comprising:
 - a front end input port for receiving an input signal;
 - a front end output port;
 - a first radio frequency path electrically coupled to the front end input port;
 - a second radio frequency path electrically coupled to the front end input port;
 - a first mixer circuit having a first input port, a first output port and a second input port and disposed within the first radio frequency path for receiving the input signal at the first input port, an oscillating signal at the second input port, and for providing a first output signal at the first output port thereof;
 - a low noise amplifier circuit having an input port and an output port and disposed within the second radio frequency path for in a first mode of operation receiving the input signal at the front end input port, for amplifying the input signal within a predetermined frequency band, and for providing an amplified signal at the output port thereof, and in a second mode of operation for other than amplifying the input signal; and,
 - a second mixer circuit having a first input port, a first output port and a second input port and disposed within the second radio frequency path for in the first mode of operation receiving the amplified signal at the first input port, an oscillating signal at the second input port, and for providing a second output signal at the first output port thereof,
 - wherein the first output signal and the second output signal are selectably coupled to the front end output port.
2. [currently amended] A television cable tuner front end according to claim 1, comprising:

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a power control ~~circuit~~ ~~circuitry~~ electrically coupled to the second mixer, the power control circuit for turning off ~~disabling~~ the second mixer in the second mode of operation ~~in order to further reduce power utilisation of the circuit over the first mode of operation.~~

3. [currently amended] A television cable tuner front end according to claim 1, comprising:

a control circuit electrically coupled to ~~for measuring an output signal emitted from the front end output port and receiving a level signal generated in dependence of a magnitude of the one of the first output signal and the second output signal selectably coupled to the front end output port, the control circuit for disabling one of and at least for other than enabling electrical components disposed in either the first radio frequency path and [[or]] the second radio frequency path [[paths]] in dependence of the level signal thereof.~~

4. [currently amended] A television cable tuner front end according to claim 1, comprising:

a control circuit electrically coupled to the front end input port and receiving an amplitude signal generated in dependence of ~~for measuring an amplitude of the input signal, the control circuit for disabling one of and for other than enabling electrical components disposed in either the first radio frequency path and [[or]] the second radio frequency path [[paths]] in dependence of the amplitude signal thereof.~~

5. [original] A television cable tuner front end according to claim 1, comprising:
a gating circuit for other than enabling electrical components disposed in either the first or the second radio frequency paths in dependence upon an amplitude of the input signal.

6. [original] A television cable tuner front end according to claim 5, wherein a gain difference between the first radio frequency path and the second radio frequency path during a transition from the first mode to the second mode is less than 2dB.

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7. [original] A television cable tuner front end according to claim 6, wherein a gain difference between the first radio frequency path and the second radio frequency path during a transition from the first mode to the second mode is approximately zero.

8. [original] A television cable tuner front end according to claim 1, wherein the front end input port is switchably coupled to either the first radio frequency path or the second radio frequency path.

9. [original] A television cable tuner front end according to claim 1, wherein the first mixer circuit comprises an amplifier circuit for amplifying a signal propagating from the first mixer first input port to the first mixer first output port.

10. [currently amended] A television cable tuner front end according to claim 3, comprising:

a first variable attenuator circuit disposed within the second radio frequency path comprising [.] having an input port electrically coupled to an output port of the linear low noise amplifier circuit, an attenuator control port for receiving an attenuator control signal, and an output port electrically coupled to an input port of the second mixer circuit, the first variable attenuator for controllably attenuating the amplified signal received from the linear amplifier circuit in dependence of the attenuator control signal, and providing the attenuated amplified signal to the second mixer circuit at the variable attenuator input port.

11. [currently amended] A television cable tuner front end according to claim 10, wherein the first variable attenuator circuit is controllable in attenuation in steps of 1dB.

12. [currently amended] A television cable tuner front end according to claim 11, wherein the attenuator control signal is digital and controls the ~~variable attenuator circuit includes a digital input port and wherein the attenuator circuit is digitally controllable in~~ attenuation in steps of 1dB.

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13. [currently amended] A television cable tuner front end according to claim 10, comprising:
a second variable attenuator circuit ~~disposed within the first radio frequency path~~ having an input port electrically coupled to receive the input signal, a power control port for receiving a power control signal, and an output port electrically coupled to an input port of the first mixer circuit, the second variable attenuator for controllably attenuating the input signal in dependence of the power control signal received at the second variable attenuator input port.

14. [currently amended] A television cable tuner front end comprising:
a front end input port for receiving an input signal;
a front end output port;
a first radio frequency path electrically coupled for receiving electrical signals from the front end input port;
a second radio frequency path electrically coupled for receiving electrical signals from the front end input port;
a first variable attenuator circuit disposed within the first radio frequency path and having an input port, electrically coupled to the front end input ~~first output~~ port, and an output port for providing a first attenuated signal;
a low noise amplifier circuit having an input port, coupled to the ~~second output~~ front end input port, an output port, and disposed within the second radio frequency path for providing an amplified signal; and,
a mixer circuit having a first input port, a second input port, and an output port, the mixer circuit first input port coupled for receiving the first attenuated signal and the amplified signal, the mixer circuit output port for providing an output signal to the front end output port, and the second input port for receiving an oscillating signal from an oscillator source,
wherein electrical signals within one and only one of the first radio frequency path and the second radio frequency path ~~[[paths]]~~ are enabled for provision to the mixer circuit.

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15. [original] A television cable tuner front end according to claim 14, comprising a switch having an input port coupled to the front end input port, a first output port coupled to the first radio frequency path and a second output port coupled to the second radio frequency path.

16. [currently amended] A television cable tuner front end according to claim 15, comprising:

a control circuit electrically coupled to the front end input port and receiving an amplitude signal generated in dependence of an amplitude of the input signal for measuring the input signal provided to the front end input port and for controllably, the control circuit for switching a ~~[[the]]~~ switch in order to electrically couple ~~propagate~~ the input signal to ~~[[along]]~~ one of the first radio frequency path and the second radio frequency path.

17. [currently amended] A television cable tuner front end according to claim 15, wherein the attenuator circuit and the amplifier circuit each include circuitry for presenting a high impedance to the first input port of the mixer circuit when a ~~[[the]]~~ switchably selectable element is in a state to provide electrical signals to the other of the attenuator amplifier circuit and the amplifier attenuator circuit.

18. [original] A television cable tuner front end according to claim 14, wherein the attenuator circuit and the amplifier circuit include circuitry for presenting a high impedance to the first input port of the mixer circuit when the electrical signals are provided from the other of the amplifier circuit and the attenuator circuit.

19. [currently amended] A television cable tuner front end according to claim 18, comprising a control circuit ~~response~~ responsive to an amplitude of a signal received at the front end input port for disabling circuitry within at least the amplifier circuit for selectably blocking signals propagating within one of the first and second radio frequency path.

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20. [original] A television cable tuner front end according to claim 14, comprising:
a second variable attenuator circuit disposed within the second radio frequency path.
21. [original] A television cable tuner front end according to claim 14, comprising
a summing circuit having a first input port, a second input port, and an output port, the summing circuit first input port for receiving the first attenuated signal, the summing circuit second input port for receiving the amplified signal,
wherein the first input port of the mixer circuit is electrically coupled to the summing circuit output port.
22. [original] A television cable tuner front end according to claim 21, comprising:
a second variable attenuator circuit disposed within the second radio frequency path and having an input port, electrically coupled to the low noise amplifier output port, and an output port for providing a second attenuated signal to the summing circuit second input port.
23. [currently amended] A television cable tuner front end according to claim 21, comprising:
~~comprising~~ a switch having an input port coupled to the front end input port, a first output port coupled to the first radio frequency path and a second output port coupled to the second radio frequency path; and,
a control circuit electrically coupled to the front end input port and receiving an amplitude signal generated in dependence of an amplitude of the input signal for measuring the input signal provided to the front end input port and for controllably, the control circuit for switching the switch in order to electrically couple propagate the input signal to [[along]] one of the first radio frequency path and the second radio frequency path.
24. [currently amended] A television cable tuner front end according to claim 14 comprising:

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an amplifier circuit electrically coupled to the first input port of the mixer circuit, the amplifier circuit for receiving and amplifying the one of first attenuated signal and the amplified signal wherein the mixer circuit comprises an amplifier circuit for amplifying a signal received on the mixer first input port.

25. [currently amended] A television cable tuner front end according to claim 23, wherein ~~at least one of the first variable attenuator circuit and the second variable attenuator circuit~~ is controllable in attenuation in steps of 1dB.

26. [original] A method of controlling a television cable tuner front end having a front end input port comprising the steps of:

receiving an input signal at the front end input port;

providing a low noise amplifier circuit electrically coupled to the front end input port;

when the input signal is above a predetermined threshold signal amplitude mixing the signal without further amplification with a local oscillator signal; and,

when the input signal is below the predetermined threshold signal amplitude providing the signal to the low noise amplifier circuit for amplification before attenuation and mixing thereof.

27. [original] A method of controlling a television cable tuner front end according to claim 26, wherein if the radio frequency signal is provided directly to the mixer, electrical power is other than provided to the amplifier in order to conserve electrical power.

28. [currently amended] A method of controlling a television cable tuner front end according to claim 27, comprising the step of:

providing a first radio frequency path coupled to the front end input port;

providing a second radio frequency path coupled to the front end input port; and,

wherein the low noise amplifier circuit is disposed within the second path,

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wherein reducing power provided to electrical components disposed within either the first radio frequency path or the second radio frequency path provides high attenuation along the path where electrical components are provided with reduced power.

29. [currently amended] A method according to claim 28, comprising the step of:
when the measured radio frequency power level is above the predetermined level enabling the mixer circuit disposed within the first radio frequency path and other than enabling the ~~linear~~ low noise amplifier circuit and second mixer circuit disposed within the second radio frequency path; and, where when the measured radio frequency power level is below the predetermined level, other than enabling the mixer circuit disposed within the first radio frequency path and enabling the linear amplifier circuit and second mixer circuit disposed within the second radio frequency path.